

### SM3H 9.7 Parametric Equations(Odd answers)

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Complete the table that accompanies each pair of parametric equations.

1.  $x=4t+1$ ,  $y=t-2$ , for  $0 \leq t \leq 3$

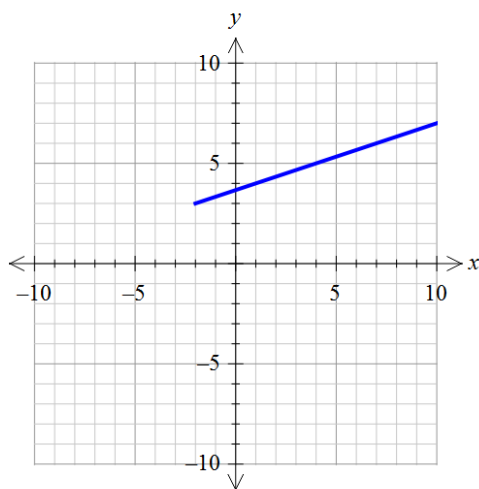
$t$	$x$	$y$
0	1	-2
1	5	-1
2	7	0
3	13	1

3.  $x=t^2$ ,  $y=3t-1$ , for  $1 \leq t \leq 5$

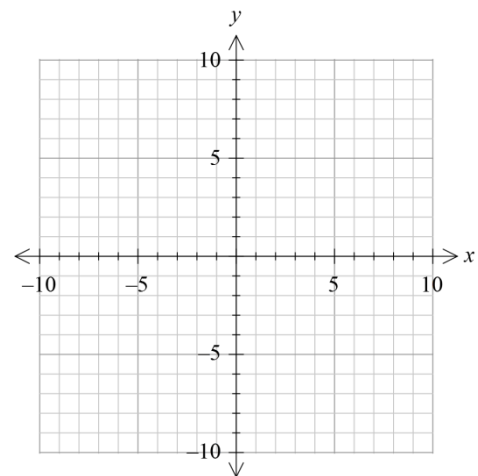
$t$	$x$	$y$
1	1	2
2.5	6.25	6.5
$\sqrt{5}$	5	$3\sqrt{5}-1$
4	16	11
5	25	14

Graph each pair of parametric equations in the rectangular coordinate system.

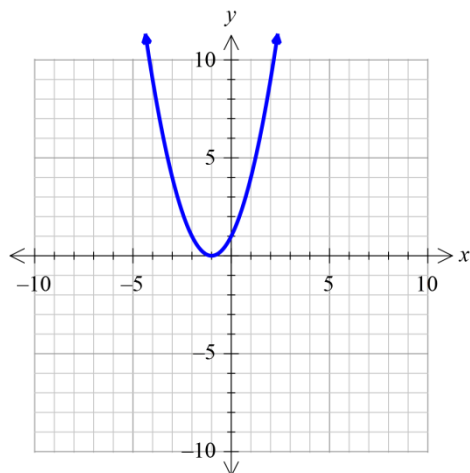
5.  $x=3t-2$ ,  $y=t+3$ , for  $0 \leq t \leq 4$



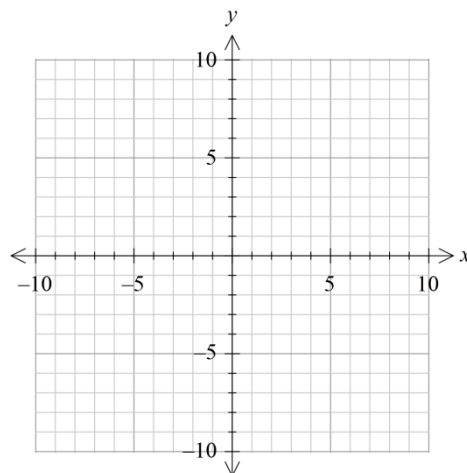
6.  $x=4-3t$ ,  $y=3-t$ , for  $1 \leq t \leq 3$



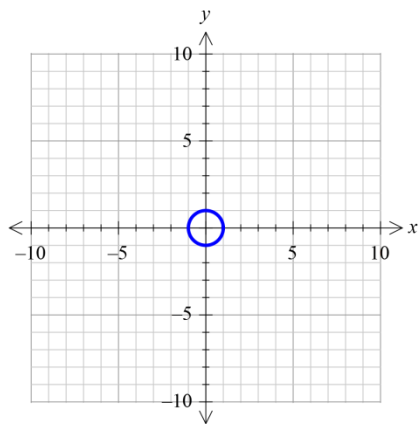
7.  $x = t - 1$ ,  $y = t^2$ , for  $t$  in  $(-\infty, \infty)$



8.  $x = t - 3$ ,  $y = \frac{1}{t}$ , for  $t$  in  $(-\infty, \infty)$



9.  $x = \cos t$ ,  $y = \sin t$



**Eliminate the parameter and identify the graph of each pair of parametric equations.**

10.  $x = 4t - 5$ ,  $y = 3 - 4t$

*Type of graph:*

11.  $x = -4\sin 3t$ ,  $y = 4\cos 3t$

Circle with radius of 4:  $x^2 + y^2 = 16$

*Type of graph:*

13.  $x = t + 4, y = \sqrt{t - 5}$

Square root curve:  $y = \sqrt{x - 9}$

Type of graph:

Write a pair of parametric equations that will produce the indicated graph. (Answers may vary.)

15. The line segment starting at  $(-2, 4)$  with  $t = 3$  and ending at  $(5, -9)$  with  $t = 7$ .

$$x = 7/4t - 29/4, y = -13/4t + 55/4 \quad 3 \leq t \leq 7$$

17. That portion of the circle  $x^2 + y^2 = 9$  that lies below the x-axis.

$$x = 3\cos t, y = 3\sin t \quad \pi \leq t \leq 2\pi$$

19. The circle whose polar equation is  $r = 2 \sin \theta$ .

$$x = \sin(2t), y = 2\sin^2(t) \quad 0 \leq t < 2\pi$$

21. Ms. Peterson hit a baseball with an initial speed of 180 feet per second at an angle of  $40^\circ$  to the horizontal. The ball was hit at a height of 3 feet off the ground.

a) Find the parametric equations that describe the position of the ball as a function of time.

$$x = (180 \cos 40^\circ)t$$

$$y = -16t^2 + (180 \sin 40^\circ)t + 3$$

b) How long is the ball in the air?

$$t \approx 7.2 \text{ sec.}$$

c) When is the ball at its maximum height? Determine the maximum height of the ball.

$$t \approx 3.6 \text{ sec.}$$

$$y \approx 212.2 \text{ feet}$$

d) Determine the distance the ball traveled.

$$x \approx 992.8 \text{ feet}$$

## Review

23. Find the trigonometric form for the complex number  $3 - 3i\sqrt{3}$ . Use radian measure for the argument.

$$6 \left( \cos \frac{5\pi}{3} + i \sin \frac{5\pi}{3} \right)$$